# INDOT

# Consultant Services Bulletin

News Bulletin No. 00-1, February 2000

# CONSULTANT NEWS BULLETIN 00-1
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**Personnel News**

Congratulations to Cindy Gorman and Nancy Strain. Cindy has been promoted to a Division Program Coordinator position and Nancy has been promoted to a Project Coordinator position. Nancy will be assuming full-time responsibility for the coordination of projects on routes 1-31 as soon as we can fill her vacated accounting position.

**Pavement Ledge Detail**

The pavement ledge detail in Appendix "A" is recommended for immediate use. This detail must be included in the plans.

**Coping Overhang**

It is not necessary to thicken the deck at the overhang, unless the design (due to railing loads, cantilever moment, etc.) requires a thicker section. If a thicker section is used at the overhang it must be reinforced.

**Expansion Joint at Bridge Rail**

The Designer shall provide a detail of the expansion joint at the bridge rail anytime the joint changes direction horizontally. See Bridge Memorandum #238. The pay quantity for all expansion joints shall be to the nearest 0.1 m.

**401 Applications**

In block number 4 of the 401 application mention (1) if a temporary runaround will be used and (2) when appropriate, the possibility of the contractor using a cofferdam and/or work causeway to construct the project.

**FAA Notice of Proposed Construction or Alteration**

The FAA has issued a new Notice of Proposed Construction or Alteration form, form 7460-1. This form and its instructions are available at http://www.faa.gov/ats/ata/ata400/OEAAA.htm .

**Rule 5**

Regardless of funding, all projects (INDOT and LPA) that disturb more than 5 acres are to comply with (Rule 5) 327 IAC 15-5. This applies to all projects on and after the April, 2000 letting.

This supercedes item 1 in consultant newsletter 94-3.

**Integral End Bents**

It will be acceptable to use integral bents on structures with a skew greater than 30º but less than or equal to 45º if the total length of the structure does not exceed 45 m. This criteria is applicable to both steel and concrete structures on tangents.

The above guideline is in addition to the policy regarding integral end bents found in Bridge Memorandum #233 (Revised 11/2/92).

**Shear Connectors on Steel Members**

When the structure is skewed 5° or less place the rows of shear connectors perpendicular to the centerline of the roadway. When the skew is greater than 5° but less than or equal to 25° place the rows of shear connectors along the skew. When the skew is greater than 25° place the rows of shear connectors perpendicular to the centerline of the roadway, which will be the same as the transverse reinforcing steel in the deck. See 9.7.1.3 of the LRFD, Second Edition. This will facilitate the placement of the deck reinforcing steel.

**Maintenance of Traffic on Shoulder**

If the maintenance of traffic plan involves traffic running on the shoulder or a portion of the shoulder, the Designer shall make a written request (with a copy to the appropriate project coordinator) to the Pavement Design Engineer regarding its use (Is the existing shoulder sufficient to handle traffic during construction or must it be removed and replaced with a full depth section?). The Designer shall provide the construction year AADT, percent trucks of AADT, and the approximate duration of traffic on the shoulder.

**"Clouds" to Show Plan Revisions**

Beginning as soon as possible, but not later than February 15, 2000, revisions to the plans, after the plans are printed for distribution to contractors (See column "Proposals Completed & Printed" on the chart in Appendix "B"; this is 5 weeks before the bid letting.), are to be shown in "clouds". We understand that with CADD it is common for the designer to delete a sheet and add a new sheet in its place even though just minor changes are made; after February 15, 2000, these changes are to be shown in "clouds" to assist the contractor in finding the changes on the sheet.

## Use of Guardrail Terminal System

Item 3 of 49 – 8.03(01) states "[w]hen the obtainable right-of-way is insufficient to use the normal configuration, a modified version of the curved w-beam guardrail terminal system should be used." Examples of restricted right-of-way are to avoid a wetland or other environmentally sensitive area or a lawn. An example of an area where additional right-of-way should be purchased rather than removing panels is agricultural land.

On 3R projects the designer is reminded to consider the guardrail article in Consultant Newsletter No. 98-1 on page 6. It may be possible to shorten the guardrail run and eliminate using a guardrail terminal system.

### Consultant Contract Change Regarding Permits

Due to recent problems associated with designers' lack of attention to permit issues the following paragraph from Appendix "A" of consultant contracts will be modified as shown in bold type for all future contracts.

> The CONSULTANT shall identify the permits required and supply completed permit application forms with all documentation necessary to obtain the permits. The CONSULTANT shall prepare the construction plans so that the plans are in compliance with all required permits. **The CONSULTANT shall track the status of permits and permit expiration dates to assure that valid permits will be available for the current project construction schedule.**

### Sight Distance During Construction

Horizontal stopping sight distance was discussed in Consultant Newsletter No. 98-2 (pages 5 and 6). In Consultant Newsletter No. 99-1 designers were advised that temporary runarounds and other maintenance of traffic plans must comply with the design criteria contained in Chapter 82 of the Design Manual for all level 1 elements. Hence, consultants must submit their computations for horizontal stopping sight distance at the Grade Review or Structure Size and Type stage or the next plan submission (if the project is already beyond the Grade Review or Structure Size and Type stage) for a temporary runaround or other maintenance of traffic plan. Stating that the temporary runaround is in accordance with Standard Drawings is not sufficient to verify that adequate horizontal stopping sight distance is provided.

Consultant Newsletter No. 98-1 (pages 9 and 10) directs the designer to submit computations for intersection sight distance. This requirement is also applicable to the maintenance of traffic phase(s) for the project.

**Vertical Stopping Sight Distance**

When the length of the vertical curve is equal to or greater than the stopping sight distance, a comparison of the K values (K required and K provided) will determine if the required stopping sight distance is provided.

When the length of the vertical curve is less than the stopping sight distance it is necessary to do the analysis by other means (for example, graphically or numerically). For passenger car stopping sight distance (Level 1) place the eye 1070 mm* above the pavement and the height of the object is 150 mm; the distance between the "eye" (or headlight, if applicable) and the object that is unobstructed (by the road, backslope of a cut section, guardrail, etc.) is the stopping sight distance provided. It is necessary to check it in both directions for 2-lane highways.

When the length of the vertical curve is less than the stopping sight distance and the stopping sight distance provided exceeds that required (even though the K provided is less than K required) the K value will be treated as a Level 3 item instead of Level 1.

* Place the headlight 610 mm above the pavement for sag vertical curves on 4R projects or other projects to be designed in accordance with Chapter 44. See 44-3.02 and 44-3.02(01).

**Change in Scope Procedure**

Do not send proposed changes in scope directly to Mr. Brad Steckler or the Engineering Assessment Section. Please follow this procedure.

1. The Designer sends proposed change in scope to the appropriate Project Coordinator (Design Division).

2. Project Coordinator will prepare routing slip and route to the Project Reviewer.

3. If the change in scope is satisfactory, the Project Reviewer sends it to the appropriate INDOT Design Section Manager along with a memorandum expressing Design's concurrence with the proposed changes.

4. If the change in scope is satisfactory, the INDOT Design Section Manager sends it to the Design Division Chief.

5. If the change in scope is satisfactory, the Design Division Chief sends it to the Project Coordinator (Design Division) who will (1) log it in the electronic coordinator data base and (2) send it to the Engineering Assessment Section Manager for concurrence.

6. If the Engineering Assessment Section Manger concurs with the change in scope, he/she returns it to the Project Coordinator (Design Division) for distribution.

**Permits**

If a DNR permit is required for a project, it is to be applied for shortly after Design Approval. Within one month after receiving notice of Design Approval the designer should send the completed permit application and attachments to the appropriate project coordinator for transmittal to Ms. Carole Scott (Design Permit Coordinator).

With respect to the 401 water quality certification, 404 (Corps) nationwide permit, and Rule 5, the designer should submit the completed applications, attachments, etc. to the project coordinator 7 months before the scheduled Ready for Letting (RFL) date for the project. The project coordinator will include the Ready for Letting (RFL) date in the transmittal to Ms. Carole Scott.

On interstate rehabilitation projects and other projects of short project development duration the 401 water quality certification, 404 (Corps) nationwide permit, and Rule 5 submissions should be made as soon as feasible, but not later than 3 months before the scheduled RFL date for the project (unless the appropriate Design Section Manager approves a later submission).

If an individual Corps permit will be needed for a project, the completed application, attachments, etc. should be submitted 13 months before the scheduled RFL date of the project.

There are now 3 counties that require permits when a project affects a regulated drain; they are Elkhart, Hamilton, and Lake. The designer should submit the application for one of these at the same time as the 401, 404 nationwide, and Rule 5 application(s).

Using the above guidelines should help us achieve our goal of receiving the required permits for a project before the RFL date.

Carole Scott will return all permit applications, etc. to the project coordinator if there is no project coordinator transmittal memorandum attached.

The designer shall track the status of permits and permit expiration dates to assure that valid permits will be available for the current project construction schedule.

**Intersection Sight Distance**

It has been brought to our attention that the values listed in Figure 46-10F are not consistent with equation 46-10.1. Hence, designers are requested to calculate the required intersection sight distance using both the AASHTO Green Book and Figure 46-10F and use the larger value for 4R projects.

With respect to 3R projects, the desired intersection sight distance is the value determined in the above paragraph. The minimum intersection sight distance for 3R projects shall be computed using the assumptions contained in 55-4.06(04) item 2. The designer shall calculate the required intersection sight distance using both the AASHTO Green Book (but using the assumptions in 55-4.06(04) item 2) and Figure 55-4C. The larger value is to be used as the minimum intersection sight distance for 3R projects.

If the required intersection sight distance is not provided, the Designer must document a Level 2 design exception. 40-8.02(02) states "the designer will document in the project file that the criteria have not been met and provide a brief rationale for not meeting the Level Two Criteria". The brief rationale for this element (intersection sight distance) must include the following.

a. State what design speed is met.
b. Summarize accident data for most recent 3 year period that is available.
c. Analyze the accident data (evaluate the accident data which is related to intersection sight distance).
d. Approximate cost to meet the required intersection sight distance.

For local transportation projects the owner of the project must furnish written concurrence with any decision not to improve the intersection sight distance to fully meet the standard. This concurrence may be in the form of a local elected official signing off on the level 2 design exception or a separate letter from the city or county engineer.

**Temporary Erosion and Sediment Control Guidelines**

I. Projects with less than 5 acres of disturbed soil
   a. If the erosion control plan has already been prepared no changes are required.
   b. If the erosion control plan has not been prepared, follow the guidelines in Section III.

II. Projects with more than 5 acres of disturbed soil
   Prepare (or revise if the erosion control plan has been prepared) the erosion control plan in accordance with the guidelines in Section III.

III. Guidelines
   a. Do not use straw bales. Generally, use riprap check dams outside the construction clear zone. See Chapter 82. Silt fence check dams can be used inside the construction clear zone.
   b. Use a sediment trap at each location just before a waterway. On bridge projects place a sediment trap at the top of bank (all 4 quadrants) before the water goes down to the stream. Sediment traps are needed before discharging into other waterways (for example, lakes).
   c. Include temporary seeding in the contract.
      Bridge contracts – Use same quantity as permanent seeding.
      Road contracts – Use one-half the quantity of permanent seeding.
   d. The specifications (a special provision must be included until the Standard Specifications are revised) must include a provision which in essence provides for temporary seeding if work is not scheduled for a period of 15 or more days.
   e. Prior practice is still acceptable for other erosion and sediment control measures (perimeter protection, protection of inlets, etc.).
   f. Other changes to the Temporary Erosion and Sediment Control Guidelines are likely, and we will keep you advised. Incorporating the above measures now will decrease the number of revisions requested by the regulatory reviewer.

**Guardrail Requirements for Large Culverts on 4R Projects Constructed on New Alignment**

New guardrail requirements have been developed for all large culverts and three-sided culverts on new alignment projects using 4R standards. These requirements shall apply to a range of structures from 1675 mm and larger culverts through and including all sizes of three-sided culverts. See Appendix "C" for guardrail placement detail to be shown in the plans.

This new guardrail placement will often occur at a location on the roadway cross section where the cover above the culvert is limited. At these locations the following guardrail configurations are recommended to accommodate the shallow cover:

1. Culvert span falls within the permissible span range for using standard nested guardrail. Use nested guardrail in accordance with the INDOT Standard Drawings.

2. Culvert cover falls within the range of 1.14m (3’-9) to 1.45m (4’-9). Use normal guardrail with 1.83m (6’-0) posts. The use of non-standard post length will require special details or a unique special provision.

3. Culvert span exceeds the permissible limit for use of standard nested guardrail and the cover falls between 0.76m (2’-6) and 1.14m (3’-9). Use cut-off guardrail posts at 1.905m spacing with nested w-beam guardrail extending 11.43m beyond the area with cut-off posts. The designer must assure that at least 1.5m of clearance exists horizontally between the face of guardrail and the culvert headwall. The use of non-standard post length will require special details or a unique special provision.

Depths of cover less than 0.76m (2'-6) can usually be avoided when designing projects on new alignment. Interstate reconstruction projects on existing alignment are generally not suitable for this guardrail placement because of R/W limitations.

**Corrections to Newsletter 99-1**

I. Slab Overhang for Steel and Concrete Bridges

The slab overhang distance (coping line to centerline of the exterior beam or girder) shall not exceed the least of the following criteria:

a. 0.45 times the interior girder spacing;
b. 0.85 times the
    1. web depth for steel bridges
    2. beam depth for concrete I-beams
    3. beam depth minus the bottom flange thickness for concrete bulb-tee beams
c. 1500 mm.

The slab overhang for concrete box beams shall not exceed 600 mm from the edge of the box.

II. Prestressed Concrete Design

1. Use #13 bars for vertical stirrups, wherever possible.

2. Consider placing 2 strands in the top flange of box beams, 2 or 4 strands in the top flange of I-beams (up to 6 strands in bulb-tee beams); it may significantly reduce the need for debonding strands. When strands are placed in the top flange, remember to note on the plans that these strands are to be cut in the field (after beams are erected) at the center of the beam, when required by design.

3. The maximum spacing of vertical stirrups in I-beams and bulb-tee beams is 2 t (where t = thickness of the web).

4. The maximum spacing of horizontal shear stirrups is 500 mm.

5. Space strands at 50 mm (2 inches) in the horizontal and vertical directions.

6. Top strands in concrete box beams should be placed near the sides of the box.

III. Decks

If the skew is greater than 25° the transverse reinforcing steel is to be placed perpendicular to the centerline of the roadway. (Note this is a policy change; see 9.7.1.3 of the LRFD, First Edition. Prior policy was 30° for decks on concrete beams and 15° for decks on steel beams or girders.)

**Practice Pointers**

1. It is not necessary to attach the following documents to the Design Summary:
   - Title sheet
   - Index
   - Documentation of Compliance for Statewide Group (  ) Categorical Exclusion
   - Cost estimate (except for interstate rehabilitation projects)
   - Design concept letter
   - Hydraulic review
   - Scour review
   - Permits (just list the permits needed in the "Prior Studies and Considerations" section)
   - Pictures
   - Pavement design (except for interstate rehabilitation projects)
2. It is not necessary to show the pavement design as a "Prior Study or Consideration" in the Design Summary.
3. It is not necessary to wait for the pavement design to obtain Design Approval.
4. Please resubmit the pavement design request for a project to the Materials and Tests Division in accordance with 52-2.0 if the actual construction year is 2 or more years different than the construction year contained in the pavement design letter.
5. The project number to show in the box in the upper left hand corner of the Title Sheet and the lower right hand corner of all sheets is the construction project number, except on right-of-way plans show the right-of-way project number.
6. Do not include the output from the pipe material selection program in the contract proposal book.
7. When there is an official detour route over INDOT roads include a diagram thereof in the contract proposal book; however, do not include a diagram of the unofficial detour route.
8. Show the guardrail on the Plan and Profile sheets and in the Guardrail table.
9. If more right-of-way is needed for a project than described in the environmental document, the designer shall submit a written request to the Environmental Section to determine if an Additional Information is required.
10. On metric projects use 420 MPa for Grade 60 steel. See 5.4.3.1 of the AASHTO LRFD Bridge Design Specifications, 2nd Edition. See also 910.01 of the Standard Specifications. This supercedes the value of 410 MPa given in the Plan Metrication Guidelines.
11. On metric projects use 28 MPa for 4 Ksi concrete. See 5.4.2.1 of the AASHTO LRFD Bridge Design Specifications, 2nd Edition. This supercedes the value of 27 MPa given in the Plan Metrication Guidelines.
12. Analyze intersection sight distance for local service roads and frontage roads the same as public roads.
13. Where practical, show the length of straight bars to the nearest 100 mm and bent bars to the nearest 20 mm total length. See 14-3.06(02) item 2.
14. Show the elastomer grade on the plans when you use elastomeric bearing pads. See 915.04(a) of the Standard Specifications and 14.7.6.2 and 14.7.5.2 of the AASHTO LRFD Bridge Design Specifications, 2nd Edition.
15. PH results are to be noted in the Field Check Minutes. See Design Memo 98-01.

**Maintenance of Traffic During Construction**

Temporary runarounds and other maintenance of traffic plans (excluding official detour routes) shall comply with the design criteria contained in Chapter 82 of the Design Manual. The following level 1 elements shall meet these criteria:

| | Element | Design Criteria |
|---|---|---|
| 1. | Design speed | 82 - 3.01 |
| 2. | Lane width | 82 - 3.02 |
| 3. | Shoulder width | 82 - 3.02 |
| 4. | Bridge width | 713.04 Standard Specifications |
| 5. | Structural capacity | 713.04 Standard Specifications |
| 6. | Horizontal curvature | Figure 82-3A |
| 7. | Superelevation transition length | 82 - 3.05 & chapter 43 |
| 8a. | Stopping sight distance at horizontal curves | 82 - 3.04 Use design speed for the construction zone and 43-4. |
| 8b. | Stopping sight distance at vertical curves | Sag – 82-3.06; crest – 82-3.04 and chapter 44. |
| 9. | Maximum grade | Use the 3R criteria for the design speed for the construction zone, appropriate functional classification, and rural/urban. |
| 10. | Through lane cross slope | Use the 3R criteria for the appropriate functional classification and rural/urban. When the existing shoulder is used for through traffic, 4% cross slope will be acceptable. |
| 11. | Superelevation rate | 82-3.05 |
| 12. | Vertical clearances | Use the 3R criteria for the appropriate functional classification. |
| 13. | ADA | 51-1, where sidewalks exist prior to construction. |
| 14. | Bridge rail safety performance | 713.04 Standard Specifications |

If the design for the temporary runaround or other maintenance of traffic plan does not meet the above criteria, a design exception must be requested. Follow the procedure established in 40-8.

INDOT reviewers should verify that the above criteria are met as part of the “limited review” of consultant projects.

The Designer must show the design speed for the construction zone on the first sheet of the Maintenance of Traffic Plan. The Designer shall coordinate with the appropriate District Traffic Engineer to establish the design speed for the construction zone for INDOT roads and with the LPA’s engineer for LPA projects.

Implementation: Contracts on the February, 2000 letting and thereafter must comply with the above requirements.

**Guardrail Calculations**

When determining the length of guardrail needed on the exit end of a bridge on a 2 lane road the length of need is generally based upon the need due to opposing traffic (the need for embankment height, etc. should also be checked). The clear zone to be used for this calculation should be based upon flatter than 6:1 slopes (because the vehicle would traverse the other lane and the shoulder) if the clear zone is within the shoulder; otherwise, use slope averaging, beginning at the outside edge of the adjacent travel lane, to determine the appropriate cross slope and hence clear zone to use. See 49-2.02(02). See Figure 49-8A for the outside shoulder minimum bridge approach guardrail length.

For example:

| | |
|---|---|
| design speed | 90 km/h |
| AADT | 400 vpd in Design Year |
| lane width | 1 each direction at 3.0 m |
| shoulder width | 1.2 m each side |
| side slopes | 4:1 |

For opposing traffic the clear zone to be used for calculating guardrail length is 4.0 m (flatter than 6:1). The clear zone falls on the shoulder (4.0 m is less than 3.0 +1.2). Therefore use 30 m of guardrail (including guardrail transition length).

When determining the length of guardrail needed for adjacent traffic on a 3R project with 3:1 side slopes the clear zone distance is based upon the slope of the shoulder (See Figure 49-2F.) and then adjusted as noted 49-2.03(01) item 2c.

For example:

| | |
|---|---|
| design speed | 90 Km/h |
| AADT | 600 vpd in Design Year |
| lane width | 3.3 m |
| shoulder width | 1.8 m |
| shoulder slope | 4% |
| side slopes | 3:1 |
| toe of 3:1 slope | 3.9 m from edge of shoulder |
| guardrail location | 2.1 m from edge of lane |

The clear zone is based upon the shoulder slope (4% which is flatter than 6:1); hence, 4.0 m is the clear zone. The clear zone falls on the 3:1 slope (4.0 m > 1.8 m shoulder). Hence, the adjusted clear zone ("recovery area" shown on Figure 49-2F) to be used for calculating the guardrail length is 9.3 m (1.8 m shoulder + 3.9 m to toe of 3:1 slope + 3.6 m (3.6 m is greater than 2.2 m (4.0 – 1.8)).

LR = 85 m

$$\text{Length of need} = \frac{LR\ (LH - L2)}{LH}$$

$$\text{Length of need} = \frac{85\ (9.3 - 2.1)}{9.3} = 65.81 \text{ m}$$

The cross slope of the section a distance LR in advance of the hazard point should be used to determine the clear zone.

**Guidelines for Foundation Reviews**

A Foundation Review is to be conducted by the design engineer on all bridge replacement projects. Generally, it shall be submitted at the Preliminary Plans for Final Approval (PPFA) stage. However, it is feasible (but not desirable) to obtain Design Approval without the Foundation Review.

The following guidelines are provided to help designers conduct suitable foundation reviews.

1. Minimum pile tip elevations for scour for interior substructures shall be determined by the method outlined on the “Pile Tip Elevation Guidelines” flow chart, see Appendix "E".

2. For integral pile bent bridges less than 45 m in length, it will generally suffice to use the Q100 scour elevation to determine the minimum pile tip elevation for scour.

3. For pile footings supporting beam bridges up to approximately 90 m in length, the minimum pile tip elevation shall generally be determined using the Q100 scour elevation. For longer bridges at major river crossings designers should use the Q500 scour elevation to determine the minimum pile tip elevation for scour.

4. Whenever the bottom of a pile footing is located above the Q100 scour elevation, the piling shall be designed for additional lateral restraint and column action for the unsupported pile length above Q100 scour elevation. A factor of safety of 2.0 shall be used. The piling shall also be checked for the same criteria using the Q500 scour elevation and a factor of safety of 1.0.

5. The minimum pile tip elevation for scour determined by the designer should not be confused with the estimated pile tip elevation theoretically needed to obtain the required bearing. The estimated pile tip elevation is found in the Geotechnical Report. The lower of these two pile tip elevations is used for determining the pay quantity.

6. Proposed top and bottom of footing elevations should be determined in accordance with the procedures noted on the “Pile Tip Elevation Guidelines” flow chart.

7. The mudsill (approximately 300 mm thick) of a wall pier that has a single row of piles can be considered as an open pile bent with a very deep cap; hence, the mudsill does not need to be placed below the scour elevation.

8. Design piers on floodplains as river piers. Locate their foundations at the appropriate depth if there is a likelihood that the stream channel will shift during the life of the structure or that channel cutoffs are likely to occur. For structures or portions of structures that qualify as overflow structures, consult the INDOT Hydraulics Unit.

Good engineering judgment should always be used in conjunction with the “Pile Tip Elevation Guidelines” flow chart when recommending pile tip and footing elevations.

**Foundation Review**

1. Designer (Consultant or in-house designer) receives Geotechnical Report.

2. At the Preliminary Plans for Final Approval (PPFA) stage the Designer proposes the foundation using the Foundation Review form:

    a. Spread footing
        (1) Type - On rock or soil
        (2) Size - N/A
        (3) Design load (Maximum allowable bearing pressure)
        (4) Ultimate load - N/A
        (5) Min. Pile Tip Elevation - N/A
        (6) Use Pile Tip - N/A
        (7) Bottom of footing elevation
        (8) Top of footing elevation

    b. Footing supported on piles or pile bent
        (1) Type (H pile or pile shell)
        (2) Size
        (3) Design load
        (4) Ultimate load
        (5) Minimum pile tip elevation
        (6) Use pile tip or not
        (7) Bottom of footing elevation
        (8) Top of footing elevation
        (9) In the “other” area of the form discuss down drag, if applicable; note other special information.
        (10) Attach “Pile Loads Table”

    c. Drilled shaft
        (1) Size
        (2) Design load

    d. Other

3. The Designer fills out and sends the Foundation Review form to the Geotechnical Engineer (consultant or Materials and Tests Division, depending on who wrote the Geotechnical Report) for the project.

4. If the Geotechnical Engineer approves, the Geotechnical Engineer signs, dates, and returns the form to the Designer. (If the Designer is a consultant, go to step 5; otherwise go to step 7). If the Geotechnical Engineer disagrees with the recommendations the marked up form is returned to the Designer for resubmission.

5. Consultant transmits request for foundation review (containing the information listed in number 2) to Project Coordinator. The Project Coordinators for INDOT projects are:

Nancy Strain for routes 1-31
Mary Maddox for routes 32-65
Joan Staggs for routes 66-930

For LPA projects the Project Coordinators are:

Bruno Canzian – Greenfield & Fort Wayne District
Bob Rhoades – Crawfordsville & LaPorte District
Steve Dilk – Seymour & Vincennes District

6. Project Coordinator transmits request for foundation review to the Project Reviewer.

7. The Project Reviewer reviews the form and signs and dates the form if he/she concurs. The Project Reviewer then schedules a meeting with the appropriate INDOT Design Section Manager.

8. The Project Reviewer meets with the appropriate INDOT Design Section Manager to review the proposed foundation. The Project Reviewer is to bring the following information to the meeting:

    a. Geotechnical Report
    b. General Plan & Layout Sheets
    c. Scour Review memorandum

    If the Section Manager concurs with the recommendations, he/she signs and dates the form.

9. The Project Reviewer gives the completed Foundation Review form to the Project Coordinator. The Geotechnical Section is to receive a copy of all completed Foundation Review forms.

**District Comments**

In the fall of 1998 Design Division personnel and consultants visited the six District offices to seek input on constructability issues and plan quality. The following observations were made:

1. If the railroad does not attend the field check and its input is essential, the designer shall set up a separate meeting with the railroad through Design's Railroad Unit.

2. On most interstate rehabilitation projects INDOT is not acquiring additional right–of-way; hence, a few times there have been slope stability problems when backslopes have been steepened due to lengthening acceleration and deceleration lanes. Try to identify these locations at the scoping field check or as early as possible during plan preparation to obtain the Geotechnical Section's recommendations.

3. On interstate rehabilitation projects the designer should discuss the need to replace or repair the right-of-way fence at the field check. If the recommendation is different than the recommendation in the scope, it shall be noted in the field check minutes.

   The following general guidelines are to be used:

   If it is a resurfacing (including mill and resurface) project, the design life is about 10 years. Hence, if the fence will last 10 years just estimate a quantity to cover patching.

   If it is a crack and seat project, the design life is about 15 years. Hence, if the fence will last 15 years, just estimate a quantity to cover patching.

   If the pavement is being replaced (including rubblization) the design life is about 25 – 30 years. Therefore, generally replace the fence.

4. Within one week after receipt, the designer shall review the plans and proposal book for each contract (let during or after April, 2000) for which the designer is signing and sealing some or all of the plan sheets. The designer shall complete the Contract Proposal Book Certification form (see Appendix "D") and return it to the Project Coordinator.

5. If the designer needs access to or a copy of a Buyer's Report, please contact the Records Unit Supervisor, Land Acquisition Division (Janie Marks), Indiana Department of Transportation, 100 North Senate Avenue, Room N955, Indianapolis, IN 46204; Telephone (317) 233-5986.

6. When barrier wall is built on a reinforced concrete shoulder on top of an MSE wall, the designer should pay for the work as

   | | |
   |---|---|
   | Concrete barrier, Type 1 | m or LFT |
   | Concrete barrier, Type 2 | m or LFT |
   | Pavement, shoulder, reinforced | $m^2$ or SYS |

   All of the above pay items include payment for reinforcing steel. The designer must include a unique special provision for each item in the contract.

7. The designer should consider using a single row of piles at interior supports. If drift is a problem, consider using a single row of piles with a thin wall on a mudsill.

8. Invite (letter without plans) District Traffic to all field checks.

9. Show the allowable soil bearing pressure on the plans for MSE walls. See page 1 of Consultant Newsletter No. 98-2.

10. Storm sewer trunk lines should be located behind the curb or, if that is not practical, they should be located under the roadway without being located in the wheel path.

11. Use the pay items in the Standard Specifications book to pay for a temporary runaround.

12. Open bridge deck drains should not be located over a roadway, sidewalks, or railroads. If drains must be located in these areas, a closed drainage system shall be provided. A free fall exceeding 7.5 m will sufficiently disperse the falling water so that no erosion damage will likely occur beneath the bridge. In cases where the water freefalls onto riprap or flowing water, lesser freefalls will be permissible. See chapter 33-2.04 of the Design Manual.

13. Calculate the sight distance at driveways or provide a rationale why calculations are not needed. See 46-11.01(3). Try to meet the design criteria or provide written disclosure thereof to the project reviewer for consultant projects and the Section Manager for in-house projects.

14. For major projects (new road construction and added travel lanes) a Grade Review meeting shall be held. The designer shall invite district construction to attend and comment.

15. Although it is desirable to eliminate asphalt curb "under" guardrail whenever possible, there are still situations were its use is appropriate. The following is from chapter 36-6.08 of the Design Manual:

    Shoulder gutter and/or mountable curbs may be appropriate to protect fill slopes from erosion caused by water from the roadway pavement. They should be considered on 2:1 fill slopes higher than 6 m. They should also be considered on 3:1 fill slopes higher than 6 m – if the roadway grade is steeper than 2%. In areas where permanent vegetation cannot be established, the height criteria should be reduced to 3 m regardless of the grade. Inspection of the existing/proposed site conditions and contact with maintenance and construction personnel (also check with Design's Landscape Architect) shall be made by the designer to determine if vegetation will survive. Erosion control blankets can be an effective tool to facilitate the establishment of vegetation.

16. Read the preliminary site investigation and site assessment and take appropriate action (place notes on plans, include special provisions, etc.). For clarification or assistance with understanding these reports contact the Environmental Services Section Manager,

Ms. Phyllis Hockett. There have been instances where information in these documents regarding gas tanks and hazardous waste was not included in the plans or specifications.

17. Check with district construction for any as-built plans.

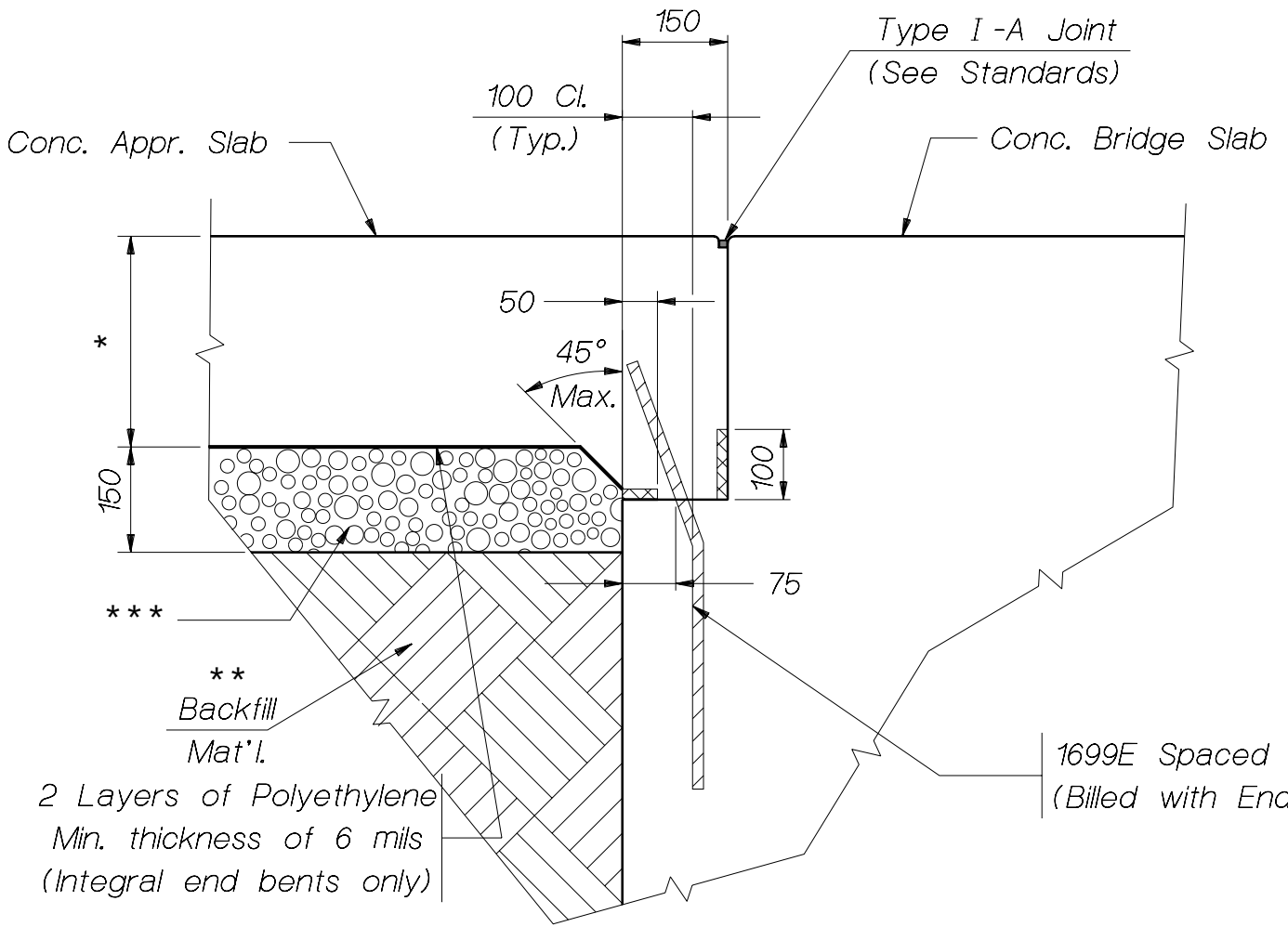
18. If a pipe is to be jacked under a road, provide room (temporary right-of-way if there is not sufficient permanent right-of-way) for a jacking pit. The designer should discuss this issue at the preliminary field check.

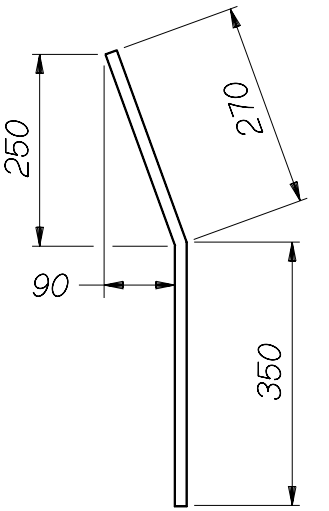
19. The designer of the "mother" project shall coordinate the combining of multiple projects into one contract. Pay particular attention to the pay items (i.e. if one has QC/QA pavement then the other must also use QC/QA pavement even if not otherwise warranted). If there is no "mother" project (for example 2 independent bridge replacement projects), the INDOT designer or project manager shall coordinate the combining of the projects into a contract.

20. Whenever practical use 1:100 scale for cross sections. See Plan Metrication Manual. The new cross section should be darker than the existing ground line.

21. Allow room for the concrete paving machine. The width to be paved plus 1.2 meters on each side is a good guide.

22. If a storm sewer is being built in city right–of-way to take storm water from INDOT's road to a river or other outlet, the designer is responsible for coordinating with the city and making sure a written agreement is executed to allow such construction. See 36-2.13 (Design Manual) and Design Memo #3.




1699E x 620

NOTES:

* 250 or match thickness of concrete approach pavement (if thicker)

** Flowable mortar if slab bridge or Coarse Aggregate #8 or #9 for all other bridges with end bents

*** Comp. Aggr. Base Type "O" if no underdrains or Subase for cement conc. pavement if underdrains.

13 mm Expanded Polystyrene

# PAVEMENT LEDGE DETAIL

Scale: 1:10

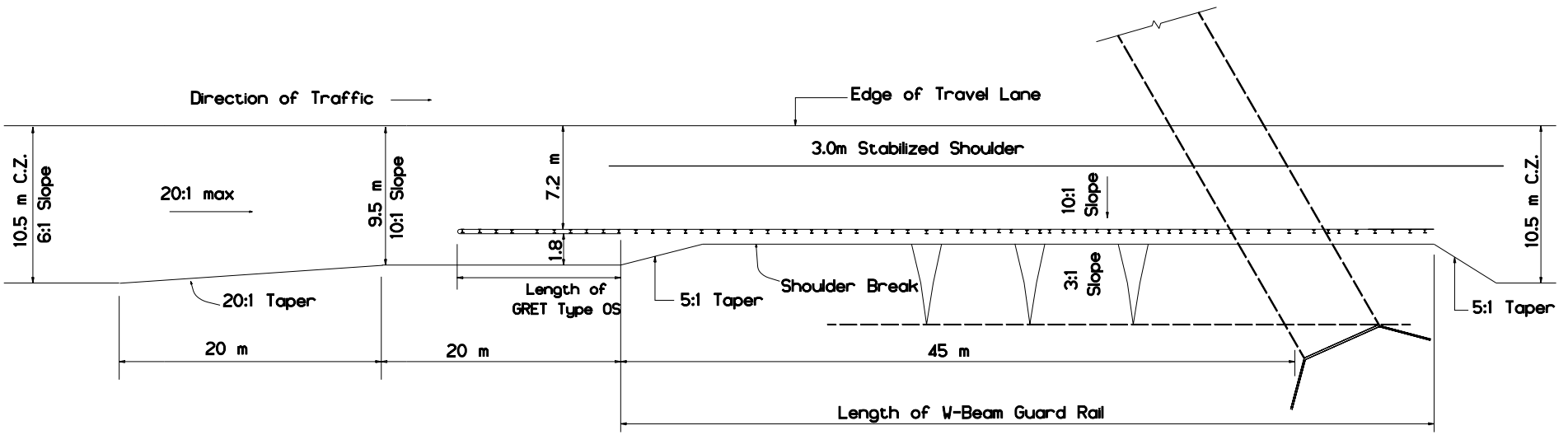
NOTE: All Dimensions are in mm

| **Bid Letting** | LPA Estimate & Plans to CSS | Plans to DRU | Ready for Letting Doc. To CSS*** | DBE Estimates To CRD** | Print Plans & Review Response* | PSE To FHWA | Ready to Advertise & Qual.Est. | PSE Corrections | Proposals Completed & Printed | Revisions Completed | Engineer's Estimate |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | 17 Weeks | 15 Weeks | 14 Weeks | 10 Weeks | 8 Weeks | 1/2 Weeks | 6 Weeks | 5 1/2 Weeks | 5 Weeks | 1 Week | 1 Day |
| 1/19/00 | 9/22/99 | 10/06/99 | 10/13/99 | 11/10/99 | 11/24/99 | 12/03/99 | 12/08/99 | 12/10/99 | 12/15/99 | 1/12/00 | 1/18/00 |
| 2/22/00 | 10/26/99 | 11/09/99 | 11/16/99 | 12/14/99 | 12/28/99 | 1/07/00 | 1/12/00 | 1/14/00 | 1/19/00 | 2/15/00 | 2/21/00 |
| 3/21/00 | 11/23/99 | 12/07/99 | 12/14/99 | 1/11/00 | 1/25/00 | 2/04/00 | 2/08/00 | 2/11/00 | 2/15/00 | 3/14/00 | 3/20/00 |
| 4/18/00 | 12/21/99 | 1/04/00 | 1/11/00 | 2/08/00 | 2/22/00 | 3/03/00 | 3/07/00 | 3/10/00 | 3/14/00 | 4/11/00 | 4/17/00 |
| 5/23/00 | 1/25/00 | 2/08/00 | 2/15/00 | 3/14/00 | 3/28/00 | 4/07/99 | 4/11/00 | 4/14/00 | 4/18/00 | 5/16/00 | 5/22/00 |
| 6/20/00 | 2/22/00 | 3/07/00 | 3/14/00 | 4/11/00 | 4/25/00 | 5/05/00 | 5/09/00 | 5/12/00 | 5/16/00 | 6/13/00 | 6/19/00 |
| 7/18/00 | 3/21/00 | 4/04/00 | 4/11/00 | 5/09/00 | 5/23/00 | 6/02/00 | 6/06/00 | 6/09/00 | 6/13/00 | 7/11/00 | 7/17/00 |
| 8/15/00 | 4/18/00 | 5/03/00 | 5/09/00 | 6/06/00 | 6/20/00 | 6/30/00 | 7/05/00 | 7/07/00 | 7/11/00 | 8/08/00 | 8/14/00 |
| 9/12/00 | 5/16/00 | 5/30/00 | 6/06/00 | 7/05/00 | 7/18/00 | 7/28/00 | 8/01/00 | 8/04/00 | 8/08/00 | 9/05/00 | 9/11/00 |
| 10/17/00 | 6/20/00 | 7/05/00 | 7/11/00 | 8/08/00 | 8/22/00 | 9/01/00 | 9/05/00 | 9/08/00 | 9/12/00 | 10/10/00 | 10/16/00 |
| 11/21/00 | 7/25/00 | 8/08/00 | 8/15/00 | 9/12/00 | 9/26/00 | 10/06/00 | 10/10/00 | 10/13/00 | 10/17/00 | 11/14/00 | 11/20/00 |
| 12/20/00 | 8/22/00 | 9/05/00 | 9/12/00 | 10/10/00 | 10/24/00 | 11/03/00 | 11/08/00 | 11/10/00 | 11/14/00 | 12//13/00 | 12/19/00 |

* - Two weeks are added to the schedule to provide more time for review of contract documents by District Construction and designers. When documents arrive late or in last minute bunches this time will be reduced.

** - State Funded - District Doc. To CSS

*** - Federal Funded - District Doc. To CSS




GUARDRAIL REQUIREMENTS FOR 3-SIDED CULVERTS
AND ALL 1675mm AND LARGER CULVERTS
ON 4R PROJECTS CONSTRUCTED ON NEW ALIGNMENT

**Contract Proposal Book Certification**

Contract: _____
Des. No.: _____
Road: _____
County: _____

I certify that I have reviewed the plans (including all revisions through Addendum No. _____ ) and the proposal book and have verified that they are correct as printed.
Designer fill in blank

_____
signature of PE

_____
date

_____
name of consulting firm or Design Section

**OR**

The plans and proposal book contain the following errors:

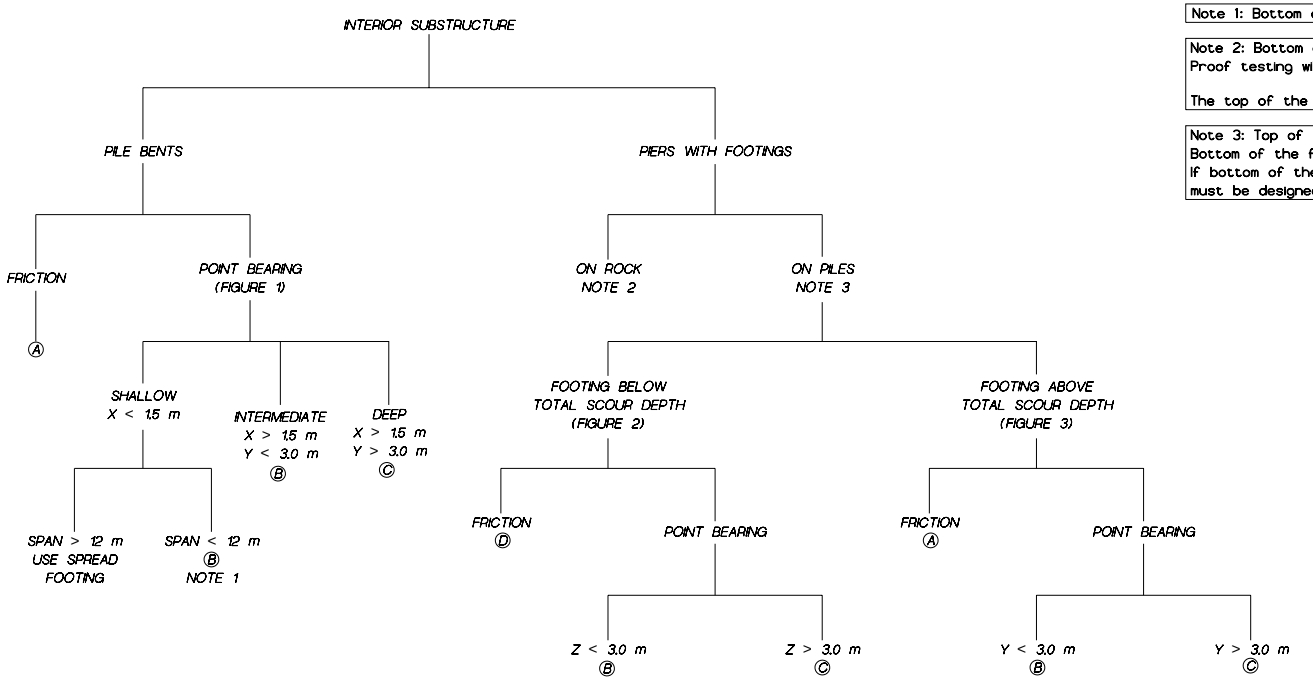
_____
signature of PE

_____
date

_____
name of consulting firm or Design Section

Return this form to the **Project Coordinator**.

JEJ:ps




Note 1: Bottom of the pile to be 1.5 m below flowline.

Note 2: Bottom of the footing to be 0.6 m below scour resistant rock. Proof testing will be required if specified in geotechnical report

The top of the footing must be below the flowline.

Note 3: Top of the footing shall be below contraction scour. Bottom of the footing shell be a minimum of 1.8 m below flowline. If bottom of the footing is above total scour depth, piles must be designed as columns.

LEGEND

Ⓐ Minimum Pile Tip elevation to be 3.0 m below total scour depth

Ⓑ Minimum 0.9 m Core into scour resistant rock

Ⓒ Drive to ultimate bearing in rock

Ⓓ Minimum Pile Tip elevation to be 3.0 m below bottom of the footing

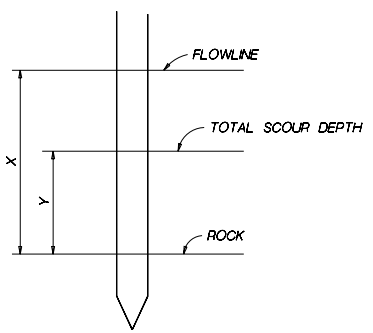



FIGURE 1

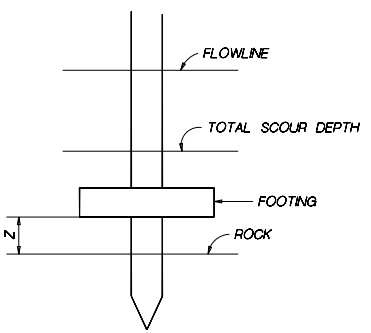



FIGURE 2

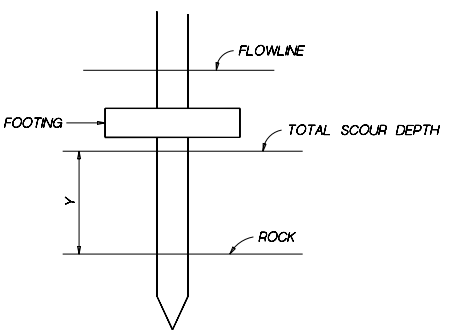



FIGURE 3

GENERAL NOTES

Cored hole in rock shall be backfilled with concrete. For friction pile, skin friction obtained above total scour elevation shall be neglected.

NOTE:
Friction piles are steel-encased and point-bearing piles are steel H-piles.

# PILE TIP ELEVATION GUIDELINES
## (For Bodies of Water)
## Figure 66-3B